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Rogers

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[54] **KNIFE WITH MULTIPLE CUTTING POSITIONS**

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Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 57,255, May 4, 1993, Pat. No. 5,325,588.

[51] **Int. Cl.**[6] **B26B 1/04**

[52] **U.S. Cl.** **30/161;** 30/155

[58] **Field of Search** 30/161, 160, 159, 158, 30/155, 151

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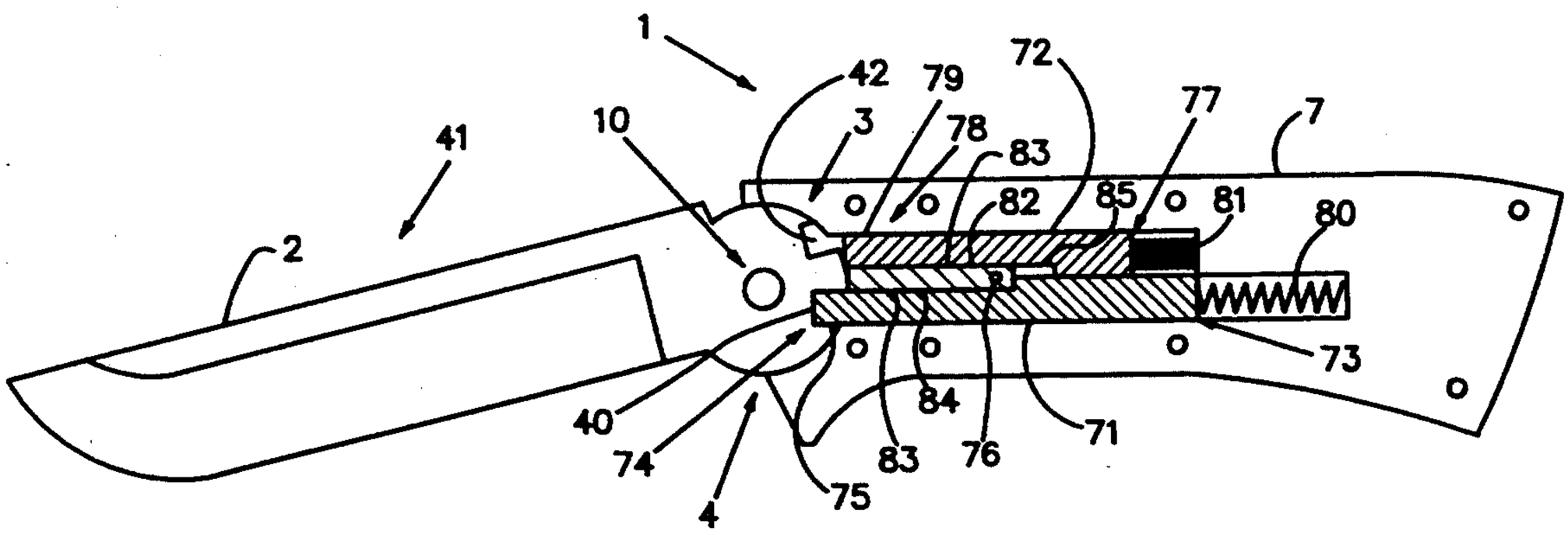
[57] **ABSTRACT**

A knife having angularly adjustable cutting positions is provided, comprising a blade having a base portion, the base portion having an outer edge including an engagement portion including a positioning mechanism for positioning the blade in multiple angular cutting positions with reference to a handle; a handle including a biased locking member for selectively engaging the positioning mechanism and fixing the blade in each of the angular cutting positions, the handle having a blade end; a spring, positioned in the handle, for biasing the locking member against the positioning mechanism; and wherein the base portion of the blade is pivotally attached to the blade end of the handle at a pivot point located within the blade end.

15 Claims, 6 Drawing Sheets



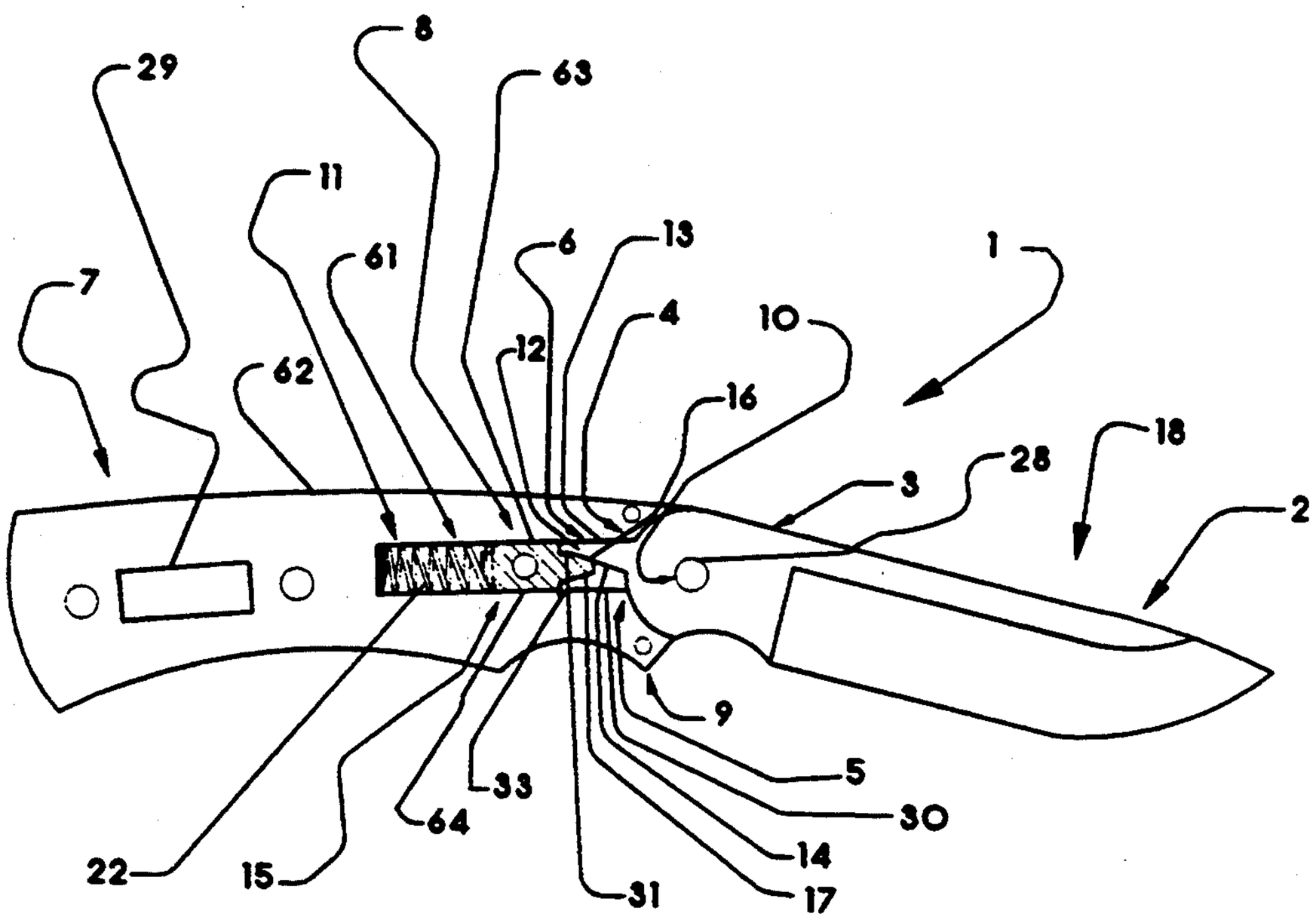

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FIG. 1

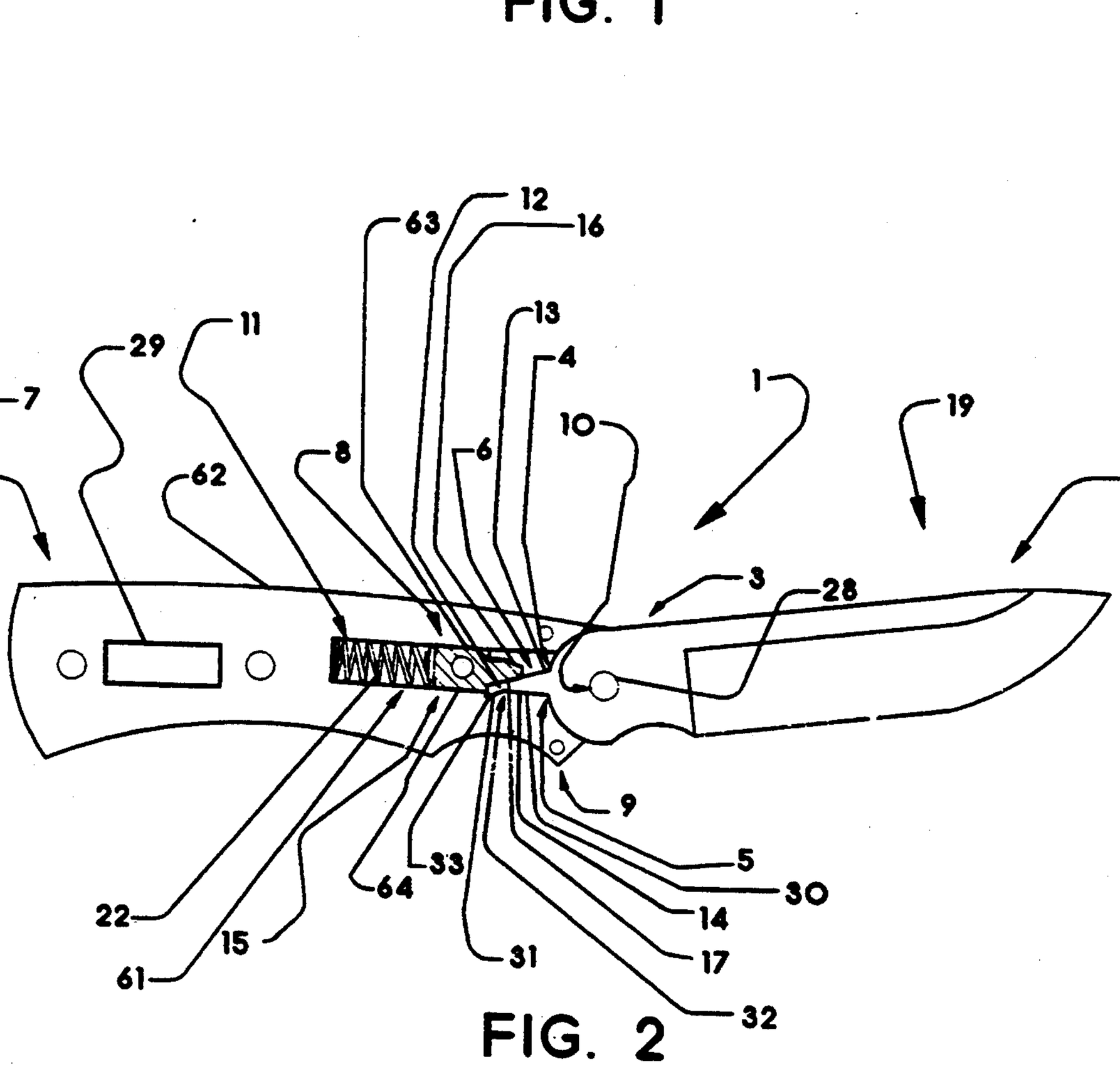
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FIG. 2

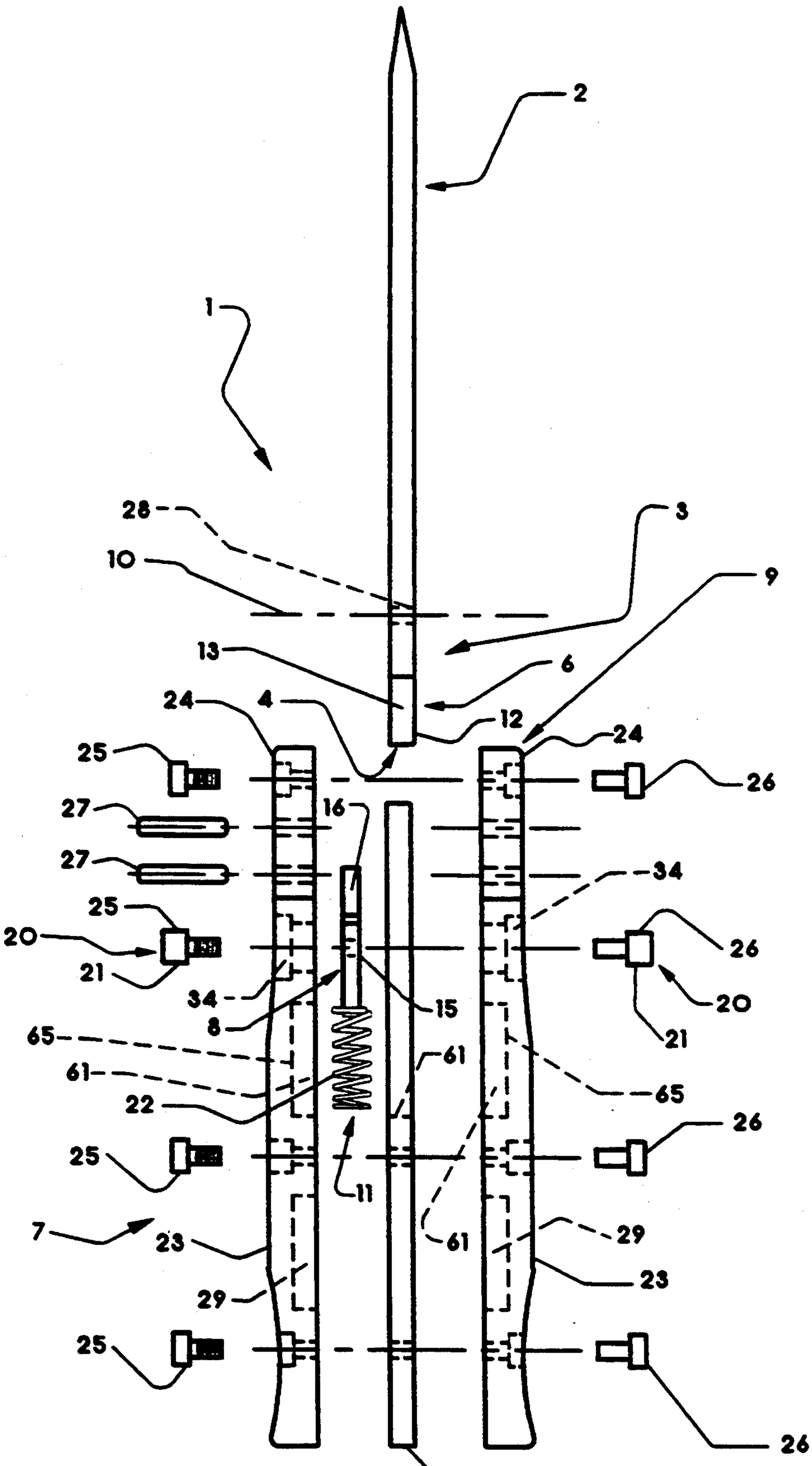
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FIG. 3

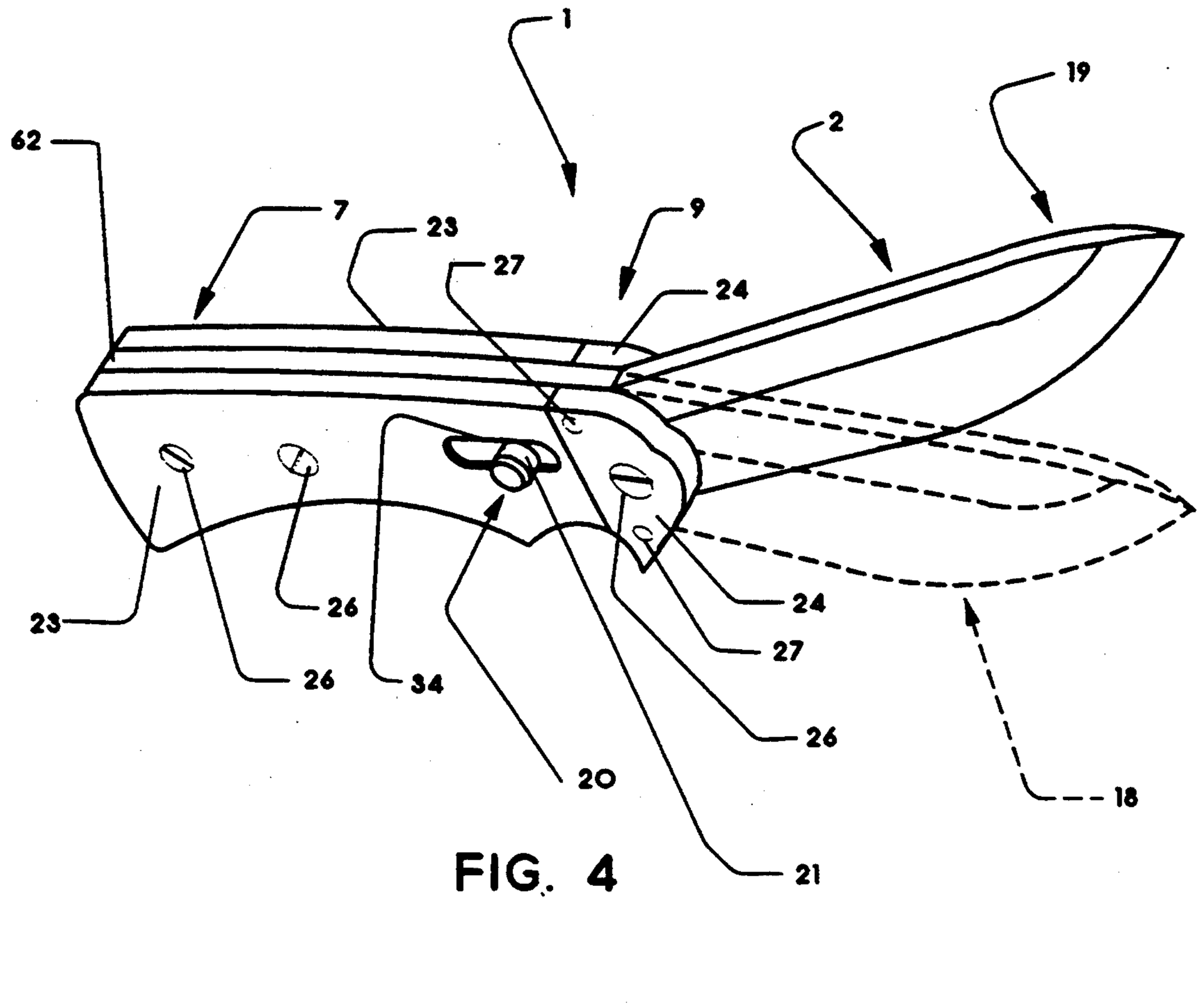

FIG. 4

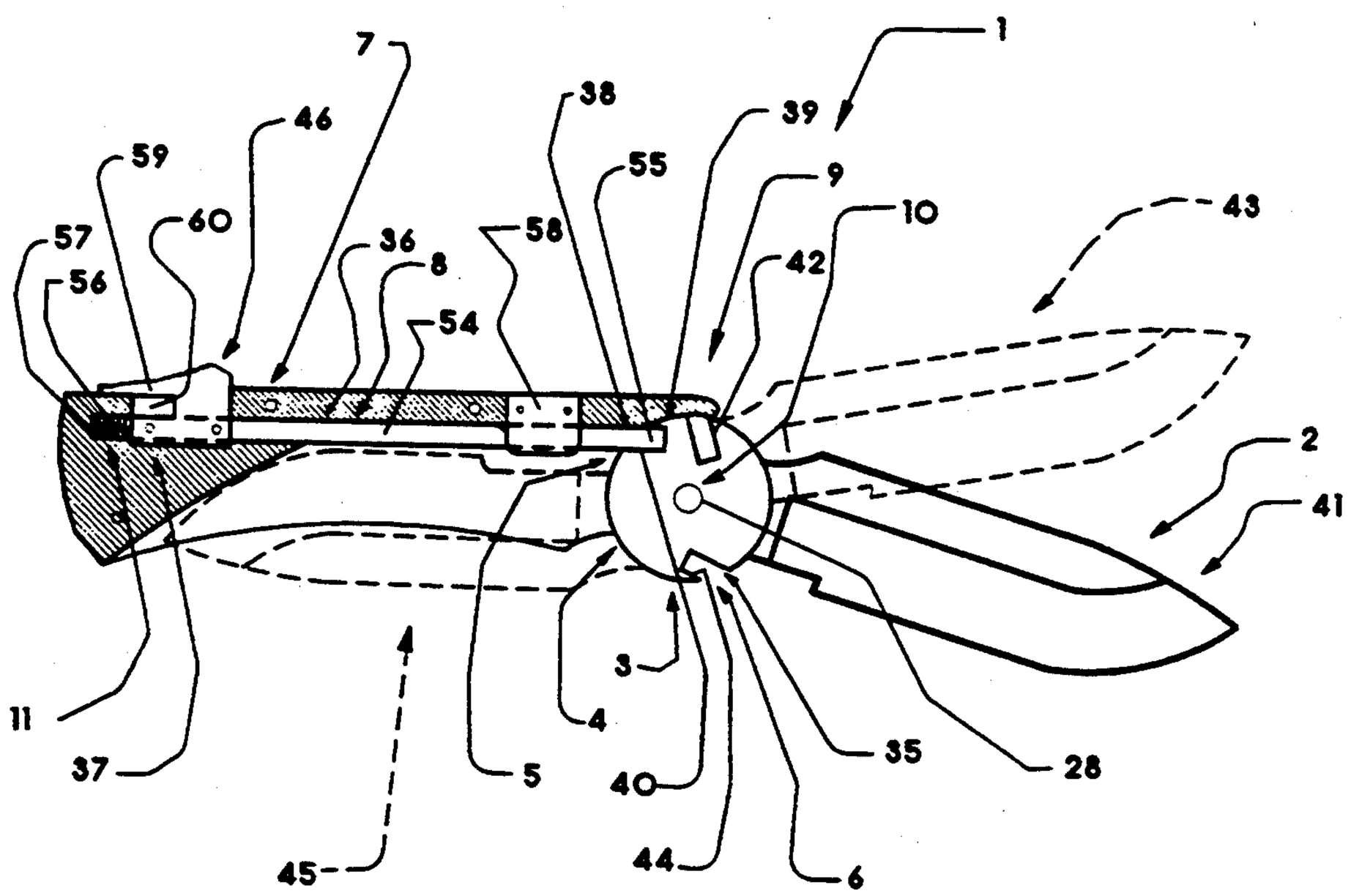
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FIG. 6

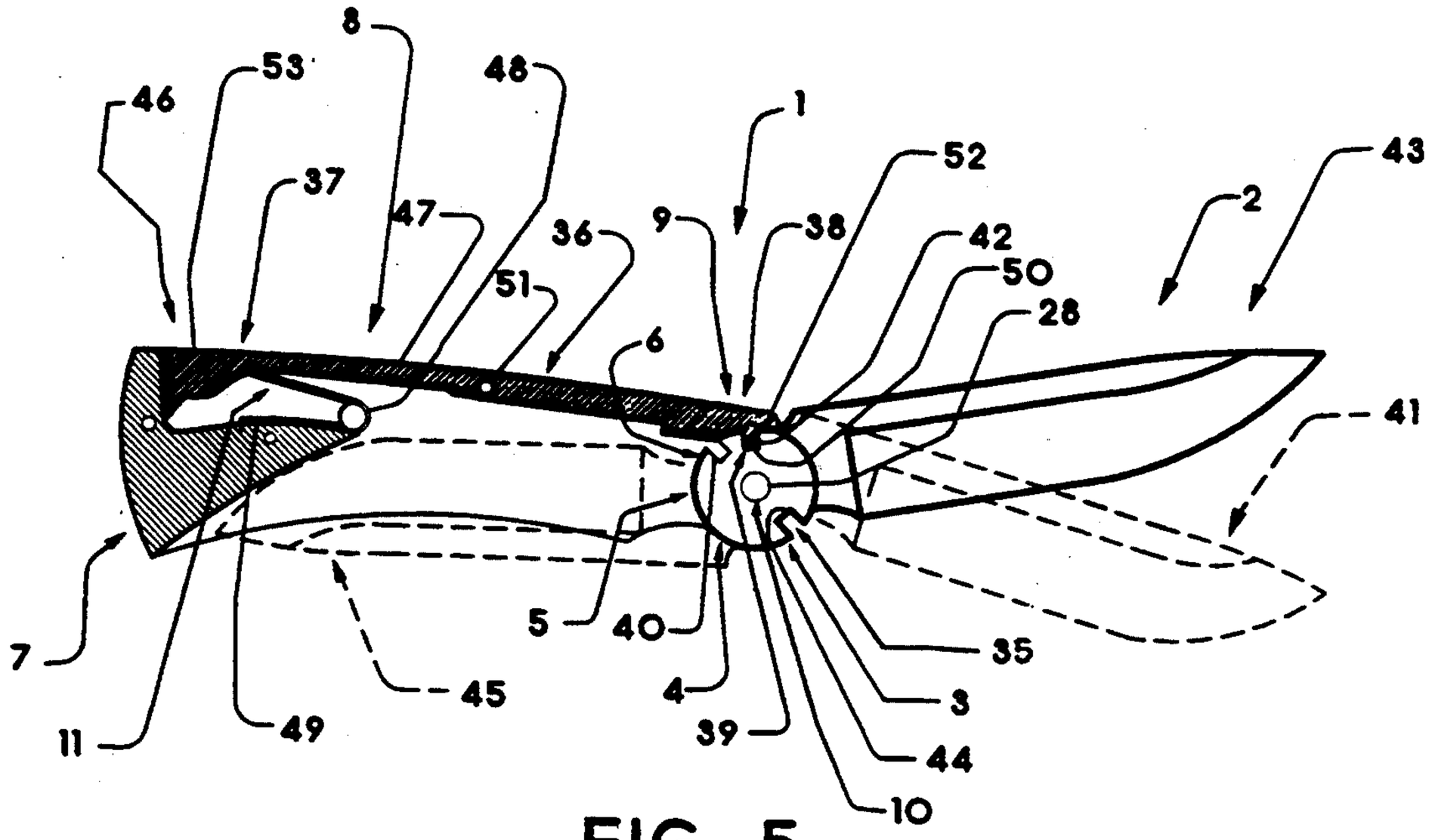
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FIG. 5

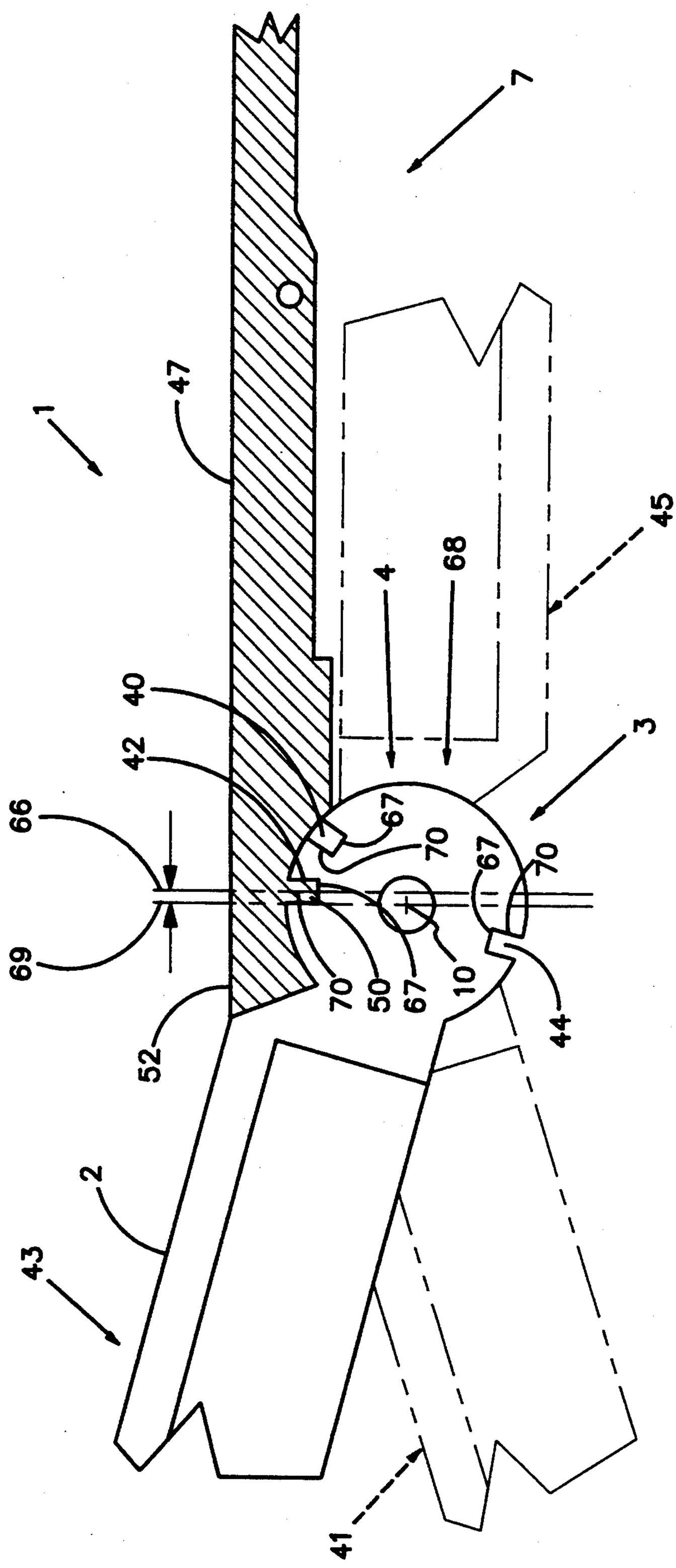

FIGURE 7

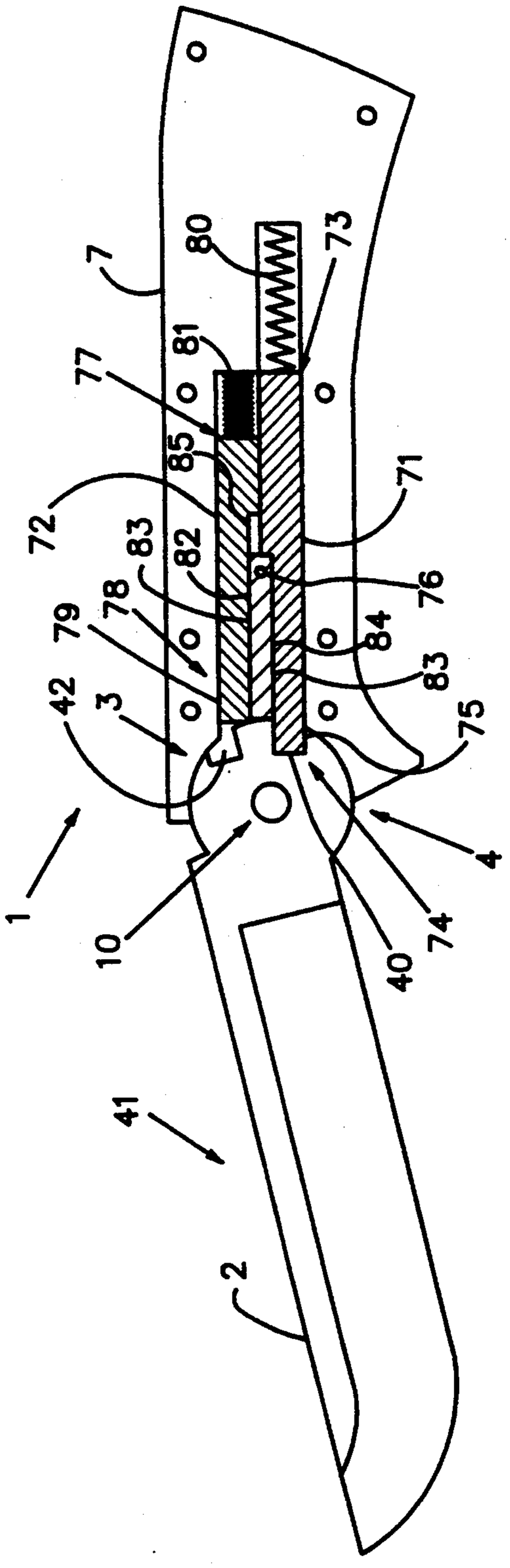

FIGURE 8

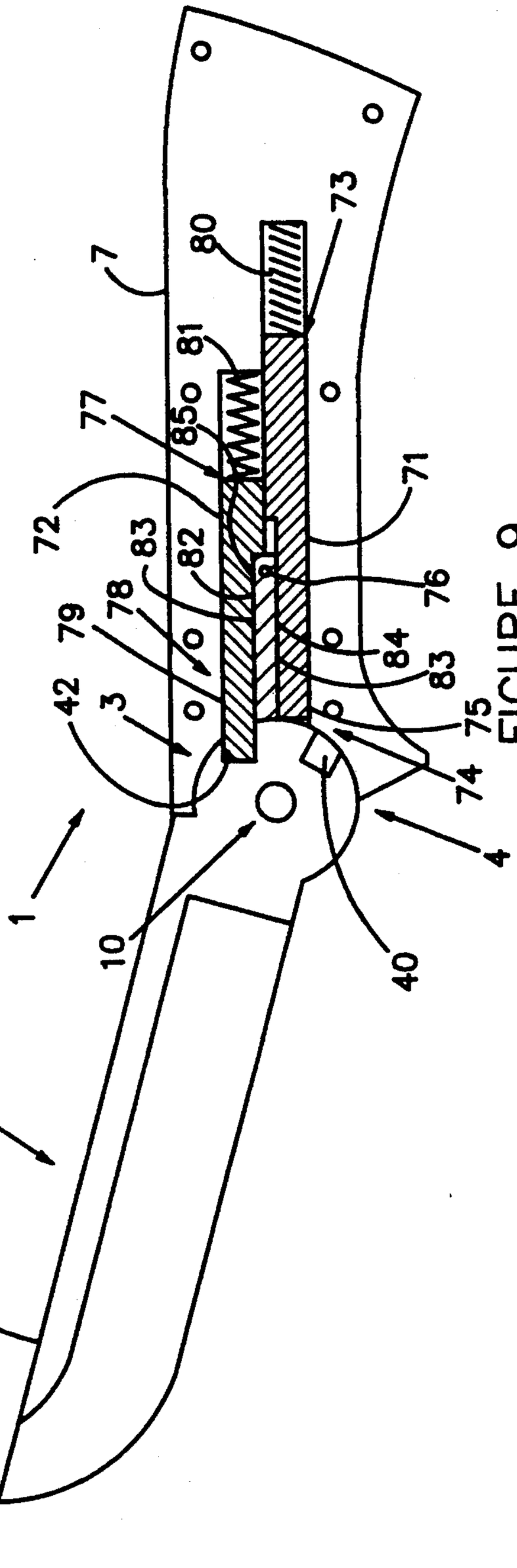

FIGURE 9

KNIFE WITH MULTIPLE CUTTING POSITIONS

CONTINUATION DATA

This is a continuation-in-part of patent application Ser. No. 08/057,255, filed on May 4, 1993, now U.S. Pat. No. 5,325,588.

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates generally to knives and, more particularly, to knives having multiple angular cutting positions.

2. Prior Art

In some applications it is desirable to use knives with different angular cutting positions. For example, when hunting it is desirable to use a knife having an angle between the cutting portion of the blade and the handle of slightly less than 180 degrees for field dressing an animal. It is also desirable to use a knife having an angle between the cutting portion of the blade and the handle of slightly greater than 180 degrees for skinning an animal. Prior to the invention disclosed herein, sportsmen often carried two specialized knives to accomplish these two tasks. Of course, the extra bulk and expense of the dual knife system is undesirable, particularly under rugged hunting conditions.

In order to address the need for adjustable blades, prior art knife designs have resorted to interchangeable blades, or to adjustable knives with relatively complex adjustment mechanisms requiring the removal of wing nuts and the like for adjustment or replacement of the blade. Again, in outdoor applications, such mechanisms are undesirable due to the possibility of losing knife parts as well as the difficulty encountered in adjusting the angle of the blade. As a result, most hunters desiring knives having field dressing, skinning or other specialized angular positions continue to carry multiple fixed blade knives in multiple scabbards or multiple folding knives.

SUMMARY OF THE INVENTION

It is therefore an object of this invention to provide a single blade knife having a blade which is easily and quickly adjustable between a plurality of curing positions.

It is another object of this invention to provide a single blade knife having multiple cutting positions which does not require the removal of any hardware to adjust the knife between cutting positions.

It is yet another object of this invention to provide a single blade knife having multiple cutting positions, and which also adjusts to a folded, or closed, position.

It is a further object of this invention to provide a single blade knife having multiple cutting positions which accomplishes various combinations or all of the above objects.

Accordingly, a knife having angularly adjustable cutting positions is provided, comprising a blade having a base portion, the base portion having an outer edge including an engagement portion including a positioning mechanism for positioning the blade in multiple angular cutting positions with reference to a handle; a handle including a biased locking member for selectively engaging the positioning mechanism and fixing the blade in each of the angular cutting positions, the handle having a blade end; a spring, positioned in the handle, for biasing the locking member against the positioning mechanism; and wherein the base portion of the blade is pivotally attached to the blade end of the handle at a pivot point located within the blade end.

Various embodiments of the knife are possible, including folding and non-folding versions as disclosed herein.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a sectional side view of an embodiment of the non-folding version of the invention in a first curing position.

FIG. **2** is a sectional side view of the embodiment shown in FIG. **1** in a second curing position.

FIG. **3** is an exploded top view of the embodiment of the invention shown in FIGS. **1** and **2**.

FIG. **4** is an assembled perspective view of the embodiment of the invention shown in FIGS. **1–3**.

FIG. **5** is a sectional side view of a folding embodiment of the invention.

FIG. **6** is a sectional side view of an alternate folding embodiment of the invention.

FIG. **7** is an enlarged sectional side view of an alternate folding embodiment of the invention shown in FIG. **5**.

FIG. **8** is a sectional side view of an alternate embodiment of the invention shown in a first cutting position.

FIG. **9** is a sectional side view of an alternate embodiment of the invention shown in a second cutting position.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS OF THE INVENTION

The invention, as shown in the Figures, comprises a knife **1** having a plurality of angularly adjustable cutting positions. The knife **1** includes a blade **2** having a base portion **3** having an outer edge **4** which further includes an engagement portion **5**. Engagement portion **5** includes a positioning means **6** for positioning blade **2** in a plurality of angular cutting positions with reference to handle **7**. Handle **7** includes a biased engagement means **8** for selectively engaging positioning means **6** and fixing blade **2** in each of the angular cutting positions. Handle **7** has a blade end **9**, where base portion **3** of blade **2** is pivotally attached at pivot point **10** within base portion **3**, as shown. A resilient means **11**, for biasing engagement means **8** against positioning means **6**, is positioned in handle **7**. Various embodiments of the knife **1** are shown in the Figures. FIGS. **1–4** depict a non-folding version having two cutting positions. FIG. **5** depicts a version which can have a folded or closed position and two or more cutting positions. FIG. **6** depicts an alternate version which can also have a folded or closed position and two or more cutting positions. Each version will be explained in greater detail below.

As shown in FIGS. **1** and **2**, the non-folding version of the knife **1** includes a positioning means **6** comprising a tail portion **12** extending from base portion **3** of blade **2**. Tail portion **12** includes an upper surface **13** and a lower surface **14**. As shown in the FIG. **3**, tail portion **12** is preferably the same approximate thickness as base portion **3** of blade **2**. Engagement means **8** comprises a locking member **15** which is slidably positioned in handle **7** between resilient means **11** and base portion **3** of blade **2**. Preferably, locking member **15** is approximately the same thickness as tail portion **12** and has an upper surface **16**, which is matingly engageable, within

a recess **61** in handle **7**, with lower surface **14** of tail portion **12** in a first curing position **18**, and a lower surface **17**, which is matingly engageable with upper surface **13** of tail portion **12** in a second curing position **19**. As shown, the positioning of tail portion **12** on base portion **3** and the angles of upper surface **16** and lower surface **17** determine the angular adjustment between first cutting position **18** and second cutting position **19**. In first cutting position **18**, tail portion **12** is fixed between upper surface **16** of locking member **15** and upper wail **63** of recess **61**. In second cutting position **19**, tail portion **12** is fixed between lower surface **17** of locking member **15** and lower wall **64** of recess **61**. Preferably, lower surface **14** of tail portion **12** includes a primary segment **30** and an end segment **31**, with primary segment **30** and said end segment **31** forming an obtuse angle **32**, as shown in FIG. **2**. This arrangement prevents blade **2** from moving from first cutting position **18** to second cutting position **19** without the user forcibly retracting locking member **15**. It is preferable that a slight indentation **33** in lower wall **64** be formed so as to matingly receive end segment **31**.

A means **20** is provided for retracting locking member **15** against resilient means **11** and away from engagement with tail portion **12** so as to allow blade **2** to be pivoted between first cutting position **18** and second cutting position **19**. Means **20** preferably comprises an actuator member **21** connected to and extending outward from locking member **15** through actuator slot **34** in handle **7** to a point exterior of handle **7**, as shown, such that locking member **15** may be operated with the thumb or other fingers.

Resilient means **11** preferably comprises a spring **22**, which is contained in an enclosed spring recess **65** in handle **7**, as shown in FIG. **3**, which forms a portion of recess **61**. Tail portion **12** protrudes into recess **61** and into contact with locking member **15**, which is interposed between spring **22** and said tail portion **12**. Handle **7** may be constructed as known in the art, provided that the elements of the invention **1** are contained accordingly. As shown in FIGS. **3** and **4**, handle **7** may include handle scales **23** and hilt plates **24**, which contain spacer plate **62**. Handle **7** is held together by bolts **25**, nuts **26** and peening pins **27** as needed. One bolt **25** and nut **26** combination occupies pivot point **10** and passes through pivot hole **28** in base portion **3** of blade **2**. A spare spring compartment **29** may be provided in handle **7**, as shown.

The embodiments shown in FIGS. **5** and **6** may be used for folding and non-folding knives, and may include multiple cutting positions. Both embodiments include a positioning means **6** comprising a plurality of slots **35** spaced apart on outer edge **4** of base portion **3** of blade **2** and extending into base portion **3**. Engagement means **8** comprises a locking member, generally denoted by **36**, positioned in handle **7**. Locking member **36** has a base end **37** and an engagement end **38**. An engagement tab **39** extends from engagement end **38**, and is selectively and matingly insertable into a first slot **40** in a first cutting position **41**. Engagement tab **39** is also selectively and matingly insertable into a second slot **42** in a second cutting position **43**. If a third slot **44** is provided, engagement tab **39** is selectively and matingly insertable into third slot **44** in a folded, or closed, position **45**. Locking member **36** is positioned in handle **7** such that resilient means **11** is biased against locking member **36**, urging engagement tab **39** against outer edge **4** of blade **2** and into one of the slots **40,42,44** when aligned therewith. Locking member **36** further comprises a means **46** for retracting locking member **36** against resilient means **11** and away from outer edge **4** so as to allow blade **2** to be pivoted between cutting positions **41,43** and/or closed position **45**. Again, handle **7** may be constructed as known in the art, provided that the elements of the invention **1** are contained accordingly. Of course, additional cutting positions may be provided by adding more slots **35**.

The particular embodiment shown in FIG. **5** utilizes a pivoting locking member **47**, which is pivotally attached to handle **7** using a pin **51** or other means known in the art. Resilient means **11**, preferably a spring **48**, is interposed between a fixed point **49** on handle **7** and base end **37** of locking member **47** such that engagement tab **50**, which preferably extends angularly from engagement end **38** toward pivot point **10**, is pivotally urged against outer edge **4** of base portion **3** of blade **2** and into one of the slots **40,42,44** when aligned therewith. In the embodiment shown in FIG. **5**, slots **40,42,44** are substantially radially spaced with reference to pivot point **10** so as to be alignable with engagement tab **50**. A tip portion **52** may be added to extend from engagement end **38** to cover empty slot **42** when blade **2** is in first position **41**. Means **46** for retracting locking member **47** includes an exposed portion **53** of base end **37** of locking member **47** exposed exterior of handle **7** so as to enable base end **37** to be urged against resilient means **11**, thus disengaging tab **50**.

FIG. **7** depicts an alternate embodiment to the one shown in FIG. **5**. Preferably, slots **40, 42, 44** are positioned such that the centerline **66** perpendicular to the base **67** of each slot crosses base portion **3** between pivot point **10** and base end **68**. This position is illustrated at second slot **42** in FIG. **7**. As shown, centerline **66** is offset from radius **69** (from pivot point **10**) in the direction of base end **68**. The positioning of slots **40,42,44** behind pivot point **10** helps to maintain blade **2** in the desired position. This is particularly important in first cutting position **41**, in order to prevent blade **2** from slipping into second cutting position **43**. Preferably, the forward wall **70** of each slot **40,42,44** coincides at least partially with a radius from pivot point **10**. More preferably, the forward wall **70** of each slot **40,42,44** substantially coincides with a radius from pivot point **10**. This position is illustrated at second slot **42** in FIG. **7**, where forward wall **70** substantially coincides with radius **69**. The other slots **40,44** are similarly positioned.

FIG. **6** depicts an embodiment of the invention **1** utilizing an axial locking member **54**, which is slidably positioned in handle **7**. Engagement tab **55** extends generally axially from locking member **54**. Resilient means **11**, preferably a spring **56**, is interposed between a fixed point **57** on handle **7** and base end **37** of locking member **54**. Engagement tab **55** is axially urged against outer edge **4** and into one of the slots **40,4:1,44** when aligned therewith. In the embodiment shown in FIG. **6**, slots **40,42,44** are offset from pivot point **10**, or substantially tangential with reference to pivot point **10**, so as to be alignable with engagement tab **55**. Of course, locking member **54** could be aligned with pivot point **10**, allowing radial slots **40,42,44** to be used similar to those of FIG. **5**, as well as other tab/slot configurations. Slide support **58**, or other suitable means known in the art, provides support for locking member **54**. Means **46** for retracting locking member **54** includes an actuator member **59** connected to and extending outward from

locking member **54** to a point exterior of handle **7** through actuator slot **60**.

FIGS. **8** and **9** depict an alternate embodiment to that shown in FIG. **6**. This embodiment utilizes a plurality of locking members **71,72**. Locking members **71,72** are slidably positioned in handle **7** in a similar manner to that shown in FIG. **6**. First locking member **71** has a base end **73**, an engagement end **74** and an engagement tab **75** extending therefrom. Engagement tab **75** is matingly insertable in first slot **40** in first cutting position **41**. Similarly, second locking member **72** has a base end **77**, an engagement end **78** and an engagement tab **79** extending therefrom. Engagement tab **79** is matingly insertable in second slot **42** in second cutting position **43**. Resilient means such as springs **80,81** bias locking members **71,72**, respectively, against outer edge **4** of base portion **3** of blade **2**. An actuator member **82** is operably connected to and extending outward from locking members **71,72** to a point exterior of handle **7**. Although not shown in FIGS. **8** and **9**, the portion of actuator member **82**, such as an outwardly extending pin extending from pin hole **76**, exterior of handle **7** may appear the same as actuator member **21** in FIG. **4**. An actuator member **82** could be provided for each locking member **71,72**. However, it is preferred that a single actuator member **82** be provided in an actuator recess **83** formed by opposing recesses **84,85** formed in locking members **71,72**, respectively, as shown. In operation, engagement tab **75** of first locking member **71** is matingly inserted into first slot **40** in a first cutting position **41**. To change cutting positions, actuator member **82** is retracted, retracting first locking member **71** and engagement tab **75** from first slot **40**, and blade **2** is rotated until engagement tab **79** of second locking member **72** is aligned with and snaps into second slot **42** in second cutting position **43**. To return to first cutting position **41** the process is simply reversed. The use of two locking members **71,72** allows for greater radial spacing between first slot **40** and second slot **42**, even when there is a small angular deviation between first cutting position **41** and second cutting position **43**.

As can be seen a versatile knife is provided which is easily adjustable between angular cutting positions without interchanging blades or removing hardware from the knife. The knife is adaptable to both folding and non-folding embodiments. Upon a review of the disclosure contained herein, other embodiments of the invention may occur to those skilled in the art, and such embodiments are intended to be included within the scope and spirit of the following claims.

I claim:

1. A knife having angularly adjustable cutting positions, comprising:

a. a blade having a base portion, said base portion having an outer edge including an engagement portion including a plurality of slots spaced apart on said outer edge of said base portion, said slots extending into said base portion;

b. a handle having a blade end, said handle including a plurality of locking members positioned in said handle, each said locking member having a base end, an engagement end and an engagement tab extending from said engagement end, said engagement tab of a first of said locking members being selectively and matingly insertable into a first of said slots in a first cutting position, and said engagement tab of a second of said locking members being selectively and matingly insertable into a second of said slots in a second cutting position, said locking members being positioned in said handle such that a resilient means is biased against each said locking member so as to urge said tab against said outer edge of said base portion and into one of said slots when aligned therewith, said handle further including a means for retracting said locking members against said resilient means and away from engagement with said outer edge so as to allow said blade to be pivoted between said cutting positions;

c. said resilient means for biasing said locking members against said outer edge of said base portion, said resilient means being interposed between a fixed point on said handle and said locking member; and

wherein each said locking member is slidably positioned in said handle such that said tab extends generally axially from said locking member and is axially urged against said outer edge of said base portion of said blade and into one of said slots when aligned therewith; and wherein said base portion of said blade is pivotally attached to said blade end of said handle at a pivot point located within said base portion.

2. A knife according to claim **1**, wherein said resilient means comprises a spring.

3. A knife according to claim **1**, wherein said means for retracting said locking members includes an actuator member operably connected to and extending outward from said locking members to a point exterior of said handle.

4. A knife according to claim **3**, wherein first and second said locking members are provided, said first and second locking members being positioned adjacent to each other and having opposing recesses forming an actuator recess, said actuator member being positioned in said actuator recess such that said actuator member will retract either said first or said second locking member when said tab of said first or said second locking member is positioned in one of said slots.

5. A knife having angularly adjustable cutting positions, comprising:

a. a blade having a base portion and a base end, said base portion having an outer edge including an engagement portion including a plurality of slots spaced apart on said outer edge of said base portion and extending into said base portion, each said slot having a base and a forward wall;

b. a handle having a blade end, said handle including a locking member positioned in said handle, said locking member having a base end, an engagement end and an engagement tab extending from said engagement end, said engagement tab being selectively and matingly insertable into a first of said slots in a first cutting position, and selectively and matingly insertable into a second of said slots in a second cutting position, said locking member being positioned in said handle such that a resilient means is biased against said locking member so as to urge said tab against said outer edge of said blade and into one of said slots when aligned therewith, said locking member further having a means for retracting said locking member against said resilient means and away from engagement with said outer edge so as to allow said blade to be pivoted between said cutting positions;

c. said resilient means for biasing said locking member against said outer edge of said blade, said resilient means being positioned in said handle; and

wherein said base portion of said blade is pivotally attached to said blade end of said handle at a pivot point located within said base portion, and wherein said slots are located such that a centerline perpendicular to said base of each said slot when engaged with said tab crosses said base portion between said pivot point and said base end.

6. A knife according to claim **5**, wherein at least three of said slots are provided, with said engagement tab being selectively and matingly insertable into a third of said slots in a closed position.

7. A knife according to claim **5**, wherein said handle further includes a means, in operational connection with said second slot, for covering said second slot when said blade is fixed in said first cutting position.

8. A knife according to claim **7**, wherein said means for covering said second slot comprises a tip portion extending from said engagement end of said locking member, said tip portion having sufficient dimensions to cover said second slot when said blade is fixed in said first cutting position.

9. A knife according to claim **7**, wherein said forward wall of said first of said slots coincides at least partially with a radius from said pivot point.

10. A knife according to claim **9**, wherein said forward wall of said first of said slots substantially coincides with a radius from said pivot point.

11. A knife according to claim **7**, wherein said forward wall of said first and second of said slots coincides at least partially with a radius from said pivot point.

12. A knife according to claim **11**, wherein said forward wall of said first and second of said slots substantially coincides with a radius from said pivot point.

13. A knife according to claim **5**, wherein said resilient means is interposed between a fixed point on said handle and said base end of said locking member, and said locking member is pivotally attached to said handle such that said tab is pivotally urged against said outer edge of said blade and into one of said slots when aligned therewith.

14. A knife according to claim **13**, wherein said means for retracting said locking member includes an exposed portion of said base end of said locking member exposed exterior of said handle so as to enable said base end of said locking member to be urged against said resilient means.

15. A knife according to claim **5**, wherein said resilient means comprises a spring.

* * * * *